

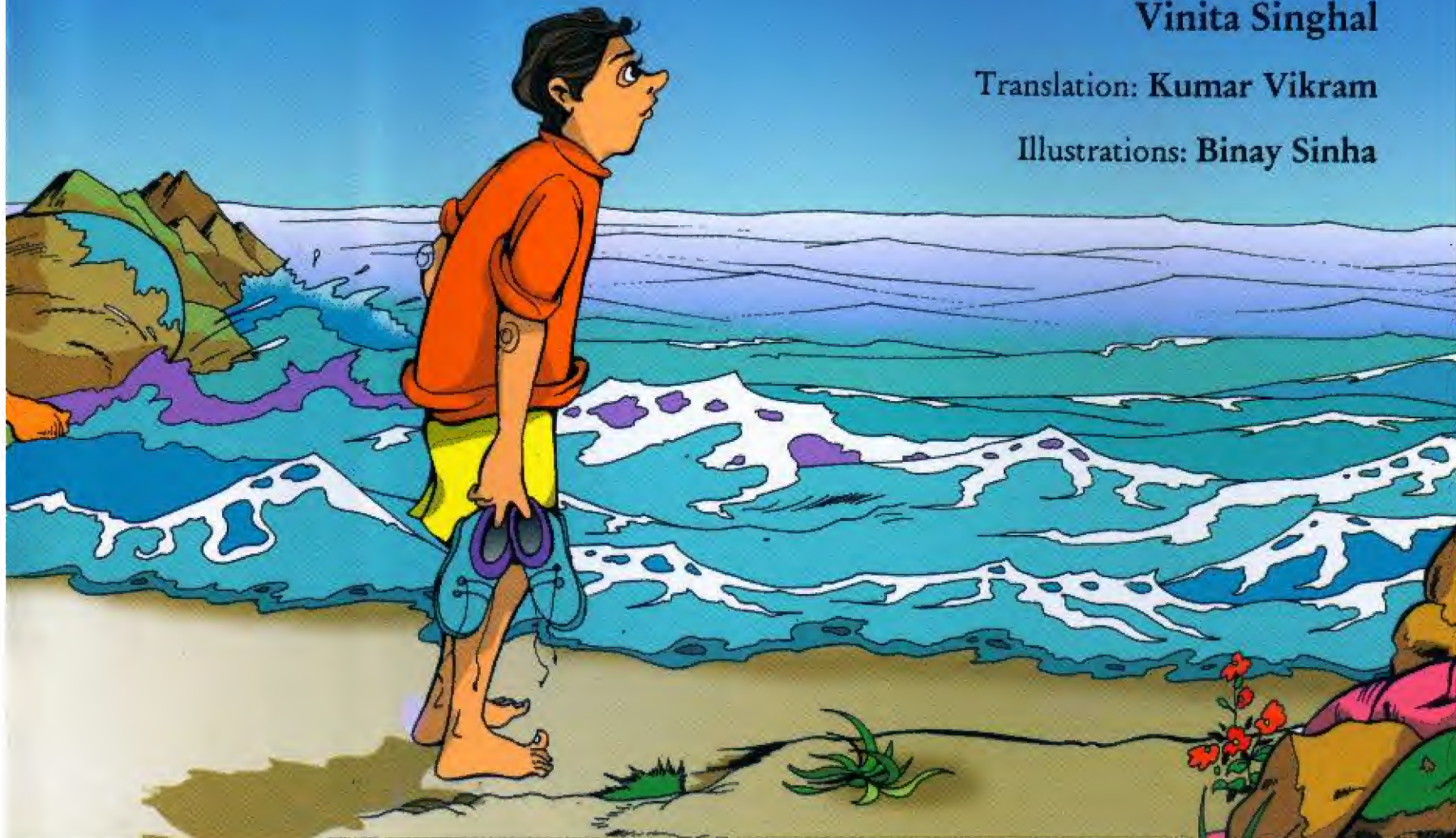


FROM LAND TO SEA

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Translation: Kumar Vikram

Illustrations: Binay Sinha



Nehru Bal Pustakalaya

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Like every other Sunday, today also Anshu came to the sea beach for a stroll with his Dadaji. The vast expanse of the blue sea and its vaulting waves attracted him. As the



waves receded after touching the shore, they left behind a wealth of shells and pearls. Anshu loved collecting them. He had collected a treasure of such shells and pearls.

Running along the sea waves, Anshu was again busy collecting shells and pearls. Whenever a wave left behind a fish, Anshu would throw it back in the water. He could not bear to see it suffer. This had been going on for quite some time now. The sunlight had become harsh by now. Dadaji was watching Anshu running around. When he found that Anshu was in no mood to come back, he called out, "Anshu, Anshu dear! Let's go, it is getting late now..."

But his voice did not make any impact on Anshu. He kept on picking something and moving farther playing with the waves.

Dadaji came close and caught hold of his arms to pull him towards the car.

"Anshu, it is too late now. Your mother would be waiting for you...She will get angry again!"

"So what?" Anshu replied sulking as he opened the door of the car.

"No, dear, you should not talk like this," Dadaji stated as both of them settled in the car. Anshu's mind was still pre-occupied with the sea.

Dadaji patted his shoulders with affection, "The sea is not going to run away! We will come here again next Sunday. You can play to your heart's content then."

"But you never allow me to play for long. Every time you take me back saying that I can play to my heart's content in the next visit!" Anshu complained.

Dadaji smiled at this and tried to change the topic, "Your vacations are about to

begin. Where do you plan to go this time?" The moment Anshu heard the word vacations, his expression changed. He had forgotten about it!

"This time, Dadaji, I will tell Papa to take us to a place where we would have to cross the sea by ship," Anshu claimed excitedly.

"Shall I name one such place...?"

"Oh yes, Dadaji, please tell me!"

"Andaman & Nicobar! You should go there these vacations. You will not only explore the sea but also get to see nature quite closely."

"Okay... Dadaji suppose there had been only sea water all around. Then?"

"Then, neither of us would have existed..."

"How come?"

"Five elements constitute life—Air, Water, Earth, Sunlight and Fire. If even one of these is missing, life ceases to exist."

Anshu understood only partially. His expression became sombre. Dadaji tried to elaborate.

"Anshu, do you know the number of planets in our solar system?"

"Yes, nine—Venus, Jupiter, Mercury, Saturn, Mars, Uranus, Neptune, Pluto and our Earth."

"Exactly. Of these, it is only our planet Earth where life exists. And that is possible because all the five elements are present here," Dadaji tried to explain to him. Anshu understood somewhat.

Suddenly as if remembering something, he asked Dadaji, "The other day, Pintu's Dadi narrated a story of the churning of oceans by the gods and demons. Out of the churning, it is said, a good number of pearls were born. Our Earth was one of them. Did it really happen that way?"

Listening to Anshu's story, Dadaji smiled.

"See, my son, whether churning of oceans took place or not, I would not be able to tell. But that the Earth was born out of this churning is not correct."

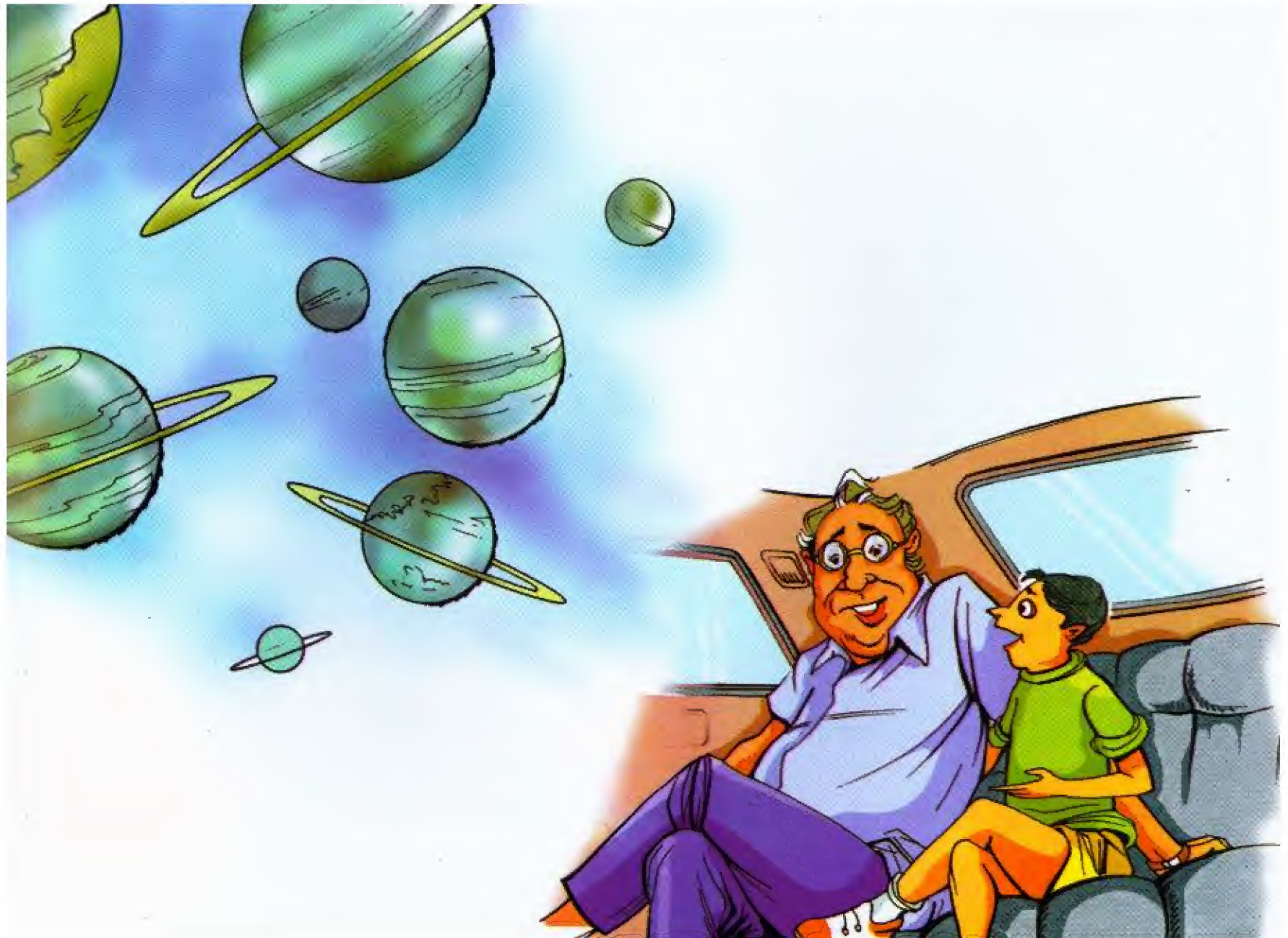
"Then, how did the Earth come into existence?"

"Billions of years ago, some large-sized clouds made of sand and gas got drawn to the centre due to the gravitational pull and over a period of billions of years took the shape of solid balls. These balls are now known as planets."

"She had also said that this Earth is suspended on the horns of a buffalo. And whenever he moves his horns, we get earthquakes."

"No, this is incorrect. All planets including the Earth move around the sun. But the Earth at the same time also moves on its axis. And as far as the cause of quakes are concerned, you first need to understand the structure of the Earth. You will then know the whole story."

Anshu's queries would never end. For, Anshu simply could not remain mum. It was beyond his control to remain quiet. Dadaji somehow never got bugged with this habit of Anshu. In fact, he believed that it was necessary for children to be inquisitive. Only then they could understand their surroundings better. At this instance too, the moment



Dadaji finished his sentence, Anshu shot another question.

"You said that the Earth came into being out of some clouds made of sand and gas. Okay, one can accept that," said Anshu nodding his head in acknowledgement like a philosopher, "But what about us? Where did we come from?"

"Now, this is a bit difficult to explain. Life started about one billion years after the birth of the Earth, that too in a very small, rather subtle form. Slowly, it kept on evolving... and today it is present in the form of us humans."

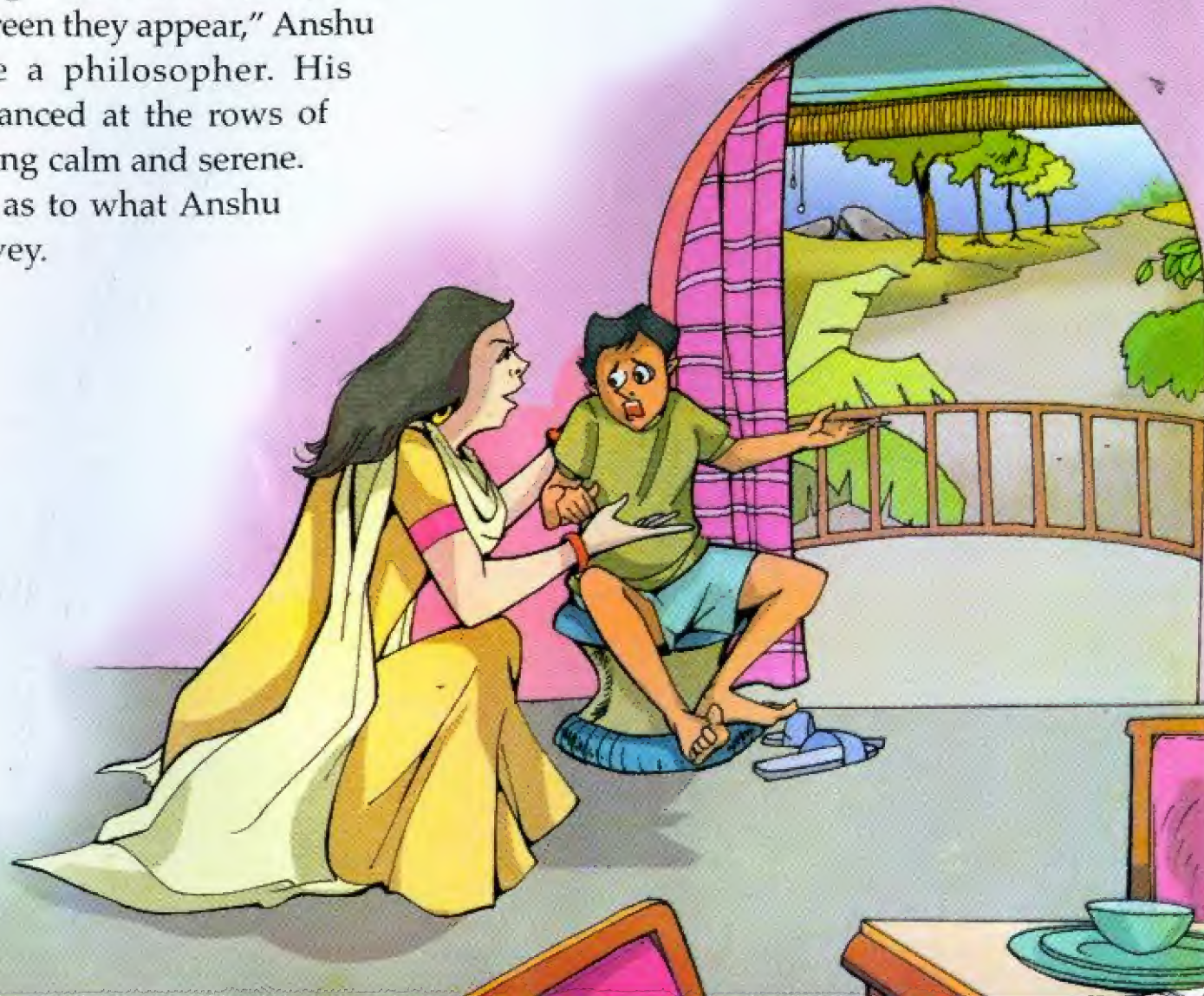
As Anshu was about to shoot another query, the car halted with a jerk. Anshu looked out of the window to see the face of his mother standing in the verandah waiting for their arrival. Anshu signalled Dadaji to save him from his mother's wrath. Dadaji smilingly assured him. Both of them got down from the car and proceeded towards the verandah.

II

"Oh, you are sitting here and I was calling out to you," Anshu's mother said caressing his hair. Anshu was sitting quietly in the balcony. He glanced at her and again returned to his thoughts.

His mother was actually surprised to see him sitting so quietly. She thought that maybe Anshu was not well. She patted him lovingly and asked, "Come on my son, your breakfast is getting cold. After all, what are you doing sitting alone?"

"I am looking at the rows of those trees. How tall and green they appear," Anshu answered like a philosopher. His mother also glanced at the rows of the trees standing calm and serene. She wondered as to what Anshu wanted to convey.



"Ma, who feeds and waters these trees? They cannot survive without manure and water!"

"They derive it from the earth. The earth itself rears them by providing compost and water. That is why it is revered as the Mother Earth," his mother explained.

"But the Earth can provide only water, what about the rest? Trees need many other things to survive, isn't it!" Anshu enquired getting up.

"See, life is made up of five elements—Air, Fire, Water, Light and Earth. Whether it is human life or that of the plants, these five elements constitute life. And out of all these, Earth is the most important element." His mother tried to solve his problem.

"This means that a lot of other things are also present in the Earth," Anshu stated moving to be seated at a dining chair. Anshu's sister Geetu, who came to sit next to him, also agreed, "Yes, most of our needs are fulfilled by the Earth itself. Isn't it Dadaji?"

"Yes, that's true. But the soil everywhere is not uniform. Don't you notice that while at some places plants crop up without any effort, at other places despite sincere efforts, they refuse to grow?" Anshu's mother said complacently while applying butter on a toast.

"That could be because the soil is barren of the essential elements needed for plants to grow," Geetu tried to boast her knowledge.

"That's great Geetu, you are a genius. You grasp things very fast," Anshu could not digest his mother's appreciation of Geetu. However, Geetu felt emboldened and gave a proud smile to Anshu, who in turn jeered at her. Geetu chased him in disgust. Before



their fight could take an ugly turn, Papa intervened and made Anshu sit near him saying, "So dear Anshu, you were asking something...?"

"I was saying that people must have tried to find out reasons behind this difference among various kinds of soil? They would have tried to investigate the ground below the surface of Earth?"

"That was not the only reason to investigate the ground beneath, there were many others also," Papa replied even before Dadaji could say something.

"What other reasons, Papa?"

"See, after witnessing phenomena like volcanic eruptions and earthquakes, it was natural for the human beings to reflect on the why and how of their occurrence. It was found that a volcanic eruption released materials that were quite different from those found on the Earth. For example, the ashes that emerged from eruptions were different from the ashes we get from burning of wood.... And gradually in the process of finding answers to these queries, many a mystery embedded in the Earth was resolved," Papa stated.

"You people are talking only about what lies beneath the Earth, but there are so many things above also," Mother intervened placing a plate of *parantha* before Anshu.

"You mean the sky, Ma?"

"No, there is something in between too, Anshu," Mother said with a smile.

"Yes, your mother is quite right...had that not existed, it would not be possible for us to breathe?" Dadaji tried to give a clue to solve the puzzle. Anshu looked alternately

at his mother and Dadaji.

"I got it, you are talking about the atmosphere, isn't it Dadaji!" Geetu answered.

"Yes, which is spread all over the Earth like a blanket over a bed," Dadaji explained, "Do you know, my dear children, that a particular kind of gas is found in the upper layer of the atmosphere that protects us from the ultra-violet rays of the sun!"

"Yes, I know. It is called the ozone layer which has developed a hole due to the rise in pollution," Anshu stated.

Not to lag behind, Geetu added, "These days, a number of scientists are trying to study the phenomena in Antarctica."

"Will you people only talk or finish breakfast also. I have a lot of other work to do," Mother complained.

"Let them ask *Bahu*, let them. If they don't ask, how will they learn?" Dadaji encouraged the children.

"I was only suggesting you people to finish breakfast. After that you can talk for hours at a stretch."

"Okay, fine. Now children, let's go to the lawn outside," Dadaji instructed getting up from the dining chair.

"It is so hot out here today. It is absolutely still as the wind is not blowing. Even the sun rays are scorching," disapproved Dadaji as he came out.

"Let's go to our room Dadaji," Geetu announced pulling his hand.

"Okay, let's go."

"Switch on the fan atleast."

"Of course dear, have some patience," Geetu interrupted Anshu.

"After all, why do we have summer? It would be so good if it were always winter time."

Dadaji said, "This is not possible because you know that the Earth not only rotates on its axis but also moves around the sun simultaneously."

"...And the climate of any place depends upon three factors," Mother also joined them after finishing her work.

"What three factors, Ma?"

"One is the way sunrays reach the earth, second is the distance from the sea and third the elevation from the sea level."

"How is that possible, I did not understand anything?"

"Let me explain. The places where the sunrays fall vertically, like the areas near the Tropic of Cancer, experience hot climate. And where the sunrays fall diagonally, the heat is less as it gets absorbed in the atmosphere," she explained.

"Similarly, the places which are situated on a higher altitude from the sea level have a cooler climate," Dadaji added.

"Hoon...I understand," Anshu nodded his head.

"But, Dadaji where do the clouds come from?" Geetu queried.

"Have you ever seen your mother making tea?"

"Yes, Dadaji, I have. But what is the connection?"

"Yes, there is. You must have seen steam coming out of the boiling water. Water evaporates in the form of steam."

"Yes, I have seen this."

"Similarly, water evaporates from oceans, rivers and lakes in the form of steam after being heated by sunrays. This very steam takes the form of clouds and the same water falls down on Earth as rain."

Before Anshu or Geetu could question further, Papa entered the room.

"You people stop troubling my father and allow him to take some rest!"

"Oh dear, I never feel tired of talking to them. Rather too much rest becomes boring."

"Papa, you had promised that you would take us out somewhere during the vacations! Hope you remember?" Anshu demanded almost swinging on his father's arm.

"Yes, Papa! You did promise! Where are you taking us?" Geetu also called out.

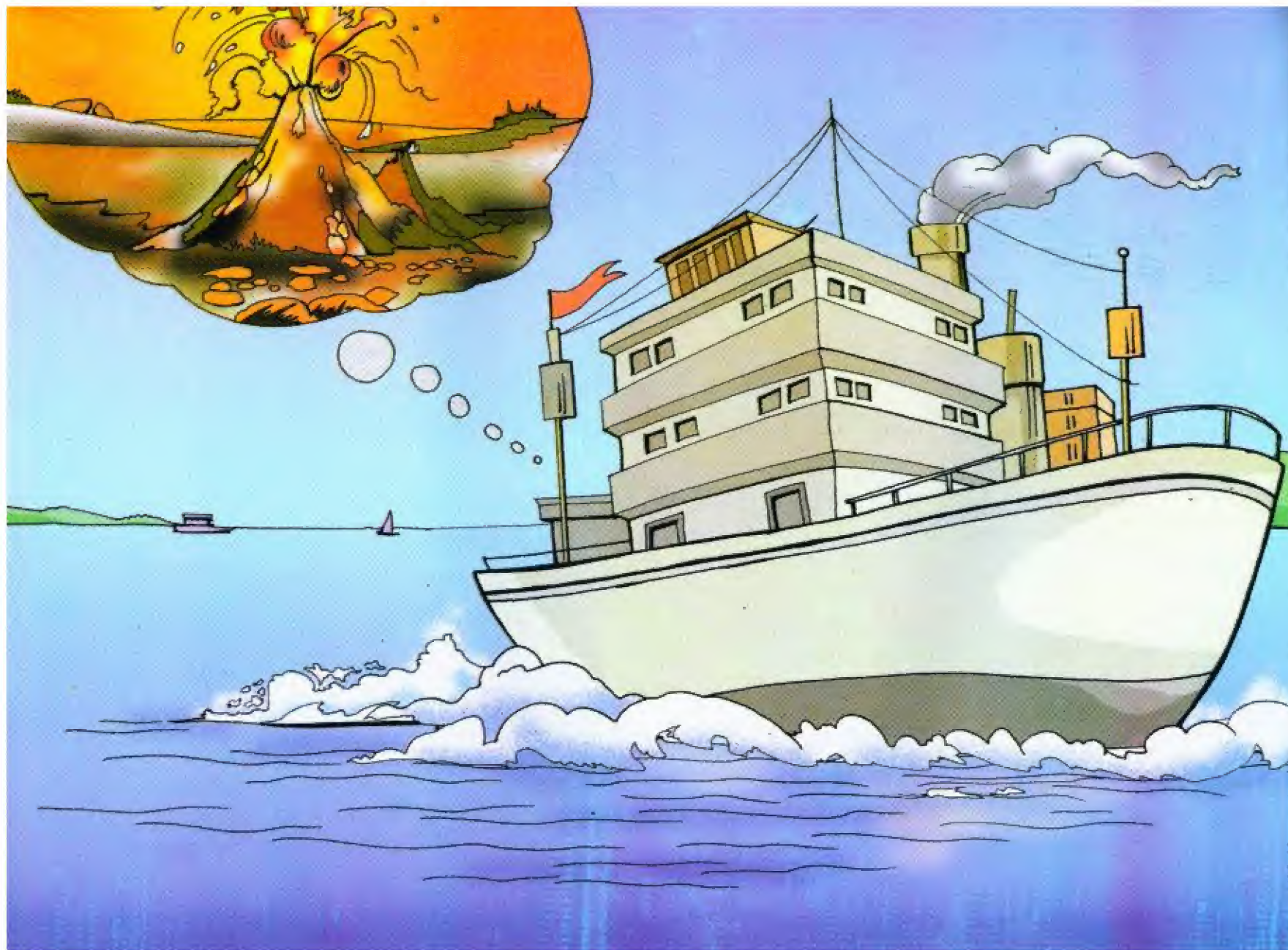
"Papa, Andaman & Nicobar is a good place. We must go there only."

"Andaman & Nicobar? How do you know about this place?"

"Actually I had told Anshu about this place. He wanted to make a trip to the sea. And it is a fact that the natural beauty you get to see in Andaman & Nicobar is hardly found anywhere else," Dadaji admitted to end the argument.

"Okay, if this is everybody's wish, then let's go there only."

On hearing this, Anshu and Geetu jumped with excitement and started dreaming about the day when they would cross the sea to visit Andaman.



III

Our ship swiftly moved across the vast expanse of the ocean heading for its destination. The rising sea waves would hit our ship every now and then. Anshu was spellbound at this game play of the waves. His dream had finally come true! In his excitement he kept on blabbering. On the other hand, Geetu was getting bored now. Initially, she also appreciated the scenario, but now after two days on the ship, she yearned to reach the shore.

"Papa, how long will it take now? I am bored of seeing water everywhere."

"Look there...that is the seashore. It is now a matter of few hours only."

"It is already two days now. And still some hours to go? I will certainly get sick now."

Anshu was enjoying the ride oblivious of all this.

"Papa, where exactly are we heading for, Port Blaire?"

"Yes dear, we are going to Port Blaire."

"Few days back there was some news about the place. Bhaiya, do you recall what had happened?"

"I am not forgetful like you. A volcano had erupted there."

"The volcano had erupted at a barren island almost 120 kilometres away from Port Blaire," Papa corrected him.

"The volcanic eruption must have spread lots of lava, ashes and small pieces of rocks as well?" Anshu enquired.

"But Papa... where do these come from?" Geetu also asked in unison.

"Look, our Earth is not so calm as it appears. Its womb stores many things," Mother commented participating in the discussion.

"Yes Ma, I had also read somewhere that when the Earth was born, it was not cool as it is now, rather it was a ball of fire," Anshu had come to know a lot about the Earth from Dadaji.

"Exactly. Gradually, as it started cooling down, the oceans, the mountains, the plains, etc. were formed."

"How did it happen, Ma? Please explain properly," Geetu could not contain her curiosity.

"The Earth was initially a ball of fire. Gradually, the rocks that lay in its core cooled down. In the process, it emitted steam that came down on the Earth in the form of rains which filled up the gorges and ravines. As a result, the oceans were formed," Mother explained indulgently to Geetu.

"And...what about the mountains? How were they created?"

"The base of the Earth is made of different plates. When these plates push each other, due to the movement of the Earth, a bulge is created. This bulge gradually takes the shape of a mountain," Papa clarified.

"But oceans, mountains, plains they form the surface of the Earth though the lava comes from beneath."

"Of course the Earth is not hollow from inside. Dadaji had informed us that the rocks

underneath melt and ooze out in the form of lava." Anshu replied to Geetu's query and turning towards his father asked, "Papa, can we visit the place where the volcano had erupted?"

"I do not know whether we'll be allowed! In any case, this happened long time back. There wouldn't be anything much to see!" Papa expressed his apprehension.

"But if Anshu and Geetu are interested we shall certainly visit the place. We might get to see things which we have no knowledge of," Mother stated taking the side of her children.

Just then, a co-traveller, who had been overhearing them turned around to claim, "Previously nobody was allowed to visit the area for security reasons but things have changed now. You can take your children there."

"But would there be anything worthwhile to see. Have you been to that place?" Papa enquired from the co-passenger.

"Oh yes, I have been there many times. Even now I am heading for the same place. I am a geologist and it is part of my duty. I am conducting a study on the minerals released by a volcanic eruption," said the passenger introducing himself.

"Oh, nice to meet you. I am Dheeraj Verma, she is my wife. He is my son Anshu and she my daughter Geetu. We have come from Mumbai to take a tour of this place."

"I had guessed as much by overhearing your discussions. Anyway, Mrs Verma is right in saying that if the children wish to visit that place, please do show them around." Then giving it a thought, he added, "If possible, please visit that place sometime tomorrow."

I will be around for the entire day. I have to collect some specimens. If the children desire to know something, I shall be available to offer explanations."

"Yes, Papa, we will go there tomorrow," Anshu insisted.

"Okay. Dr... I am so sorry, I did not ask your name even!"

"People call me Dr Mitra. I live in Delhi."

Just then the ship touched the shore of Andaman. Engrossed in conversation nobody knew how time ticked by. The first to step out was Geetu. Putting her feet on solid ground she wanted to make sure that they had actually arrived! They promised Dr Mitra about the meeting next day and moved towards the taxi.

IV

The first rays of the sun peeked through the window curtains announcing the arrival of morning and prompting Anshu to get up to welcome the new dawn. But Anshu tried to ignore the sun's rays by placing a pillow over his eyes. Just then Mother entered the room calling Anshu.

"Get up Anshu, see the sun is up and bright. Have you come here to sleep? Remember Dr Mitra would be waiting for you. Everybody else is ready to leave." Anshu immediately got up on hearing Dr Mitra's name, "Oh I had forgotten!" He rushed to the bathroom. Mother gave a big laugh as he dashed for the door.

"Come, please come, I was waiting for you people," Dr Mitra welcomed everyone and guided them to a spot where some years back a volcanic eruption had taken place.

"Now, you will find nothing except some solidified lava, ashes and pieces of rocks," he stated.

"This is what we wanted to see. For we often wondered as to where these things come from."

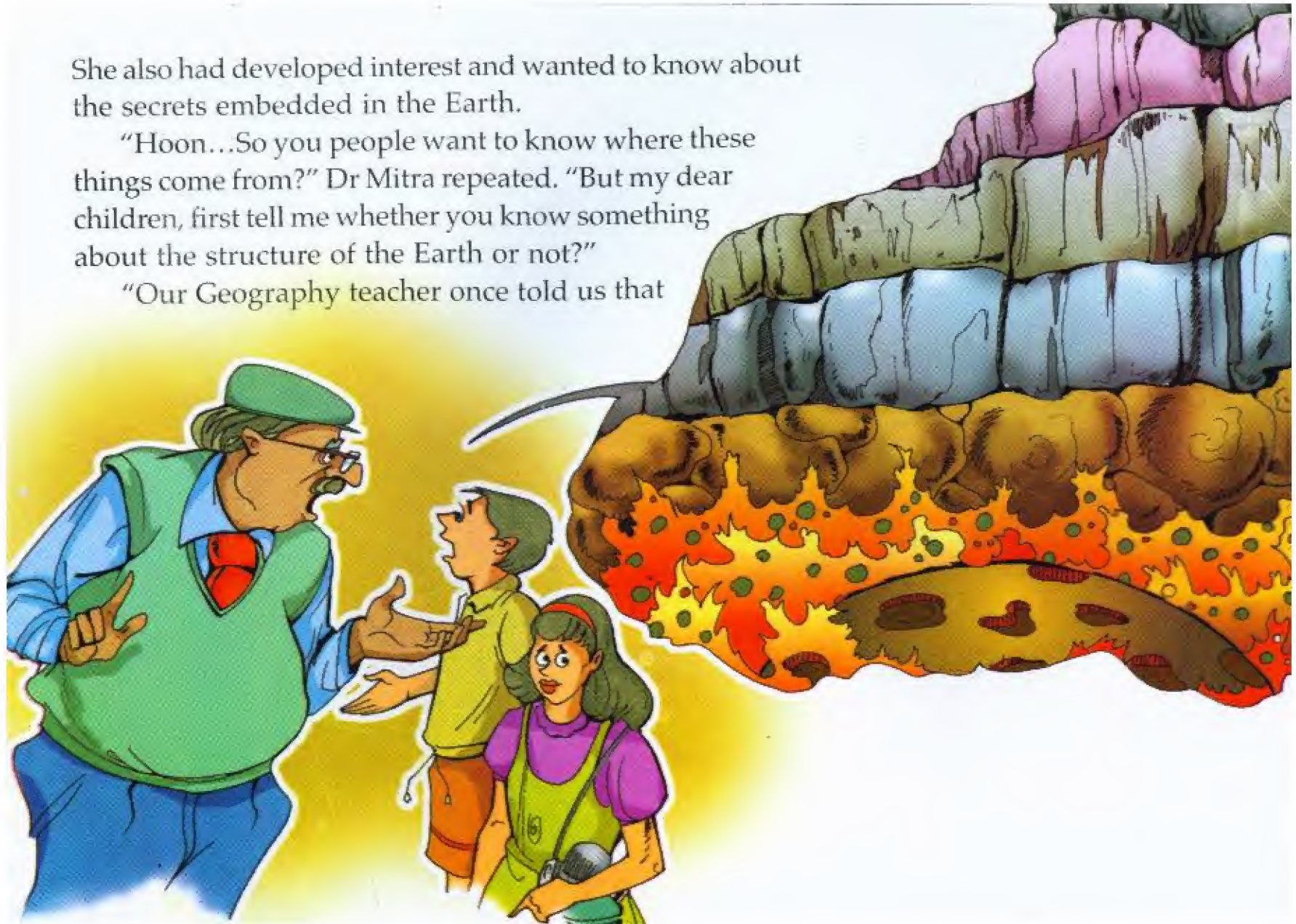
"Please tell us in detail something about this phenomenon, Uncle," Geetu requested.



She also had developed interest and wanted to know about the secrets embedded in the Earth.

"Hoon...So you people want to know where these things come from?" Dr Mitra repeated. "But my dear children, first tell me whether you know something about the structure of the Earth or not?"

"Our Geography teacher once told us that



the Earth is very hot from inside," Geetu replied promptly.

"That's true. The temperature beneath is quite high. Your teacher must have told you many other things as well."

"Yes, he told us that beneath the upper layer called the *crust* of the Earth, there is a layer of hard rocks, followed by a layer of soft rocks, underneath that there is the boiling *magma* with a round shaped solid substance in the centre."

"Excellent, you know a lot of things. This round shaped solid structure is called the *core*. The layers of hard and soft rocks are called *mantle* with the *magma* floating in between. The earthquakes or the volcanic eruptions on the Earth are an outcome of the rumblings that occur inside these layers," Dr Mitra explained, "All this happens due to changes in pressure and temperature inside the Earth."

"Uncle, do these changes take place in the layers of rocks?"

"Yes. When these rocks shake due to excessive pressure or some chemical reaction, waves are created and when these waves reach the surface of the Earth they bring chaos."

"You mean to say that earthquakes occur due to these waves?" Mother enquired. This information was news to her.

"Yes ma'am, there are many kinds of waves. At the time of earthquake, a particular type of these waves reaches the surface of the Earth and shakes it completely."

A query had been troubling Geetu for some time now. She could not resist it any more, "All these happenings take place inside the Earth, Uncle. Then how are they

known from its top?"

"The study of this is called seismology or the science of quakes. Seismograph keeps us informed about the movement and speed of these waves."

"So now we know why quakes occur. Uncle, please do tell us something about volcanoes!"

"These waves have no role to play in volcanic eruptions. *Magma* is accountable for this. Due to the rise in temperature, the rocks keep melting. These melted rocks are known as *magma*. The process of melting also produces gases in a good magnitude. This gaseous *magma* gradually moves away from the centre towards the surface of the Earth."

"Uncle, you told us that deep inside the Earth there is a round shaped solid structure," Anshu tried to re-establish the broken link.

"Yes, it is called the *core*," Dr Mitra replied.

"Is the *core* also made of rocks then?"

"No, my dear. It is not made of rocks. Anshu, may be you can tell us as to what this is made of?"

"It is not made of rocks..." he said giving it a thought, "then it might be metals."

"Do you really know or are simply guessing?"

"Whatever, but, it is bang on target. Isn't it so Dr Mitra?"

"Exactly," Dr Mitra replied laughingly, "the *core* is made of metals... mostly of iron, some elements of nickel and a small amount of cobalt."

"Has all this been guessed from the surface or somebody has really gone deep

down to confirm?" Anshu pried.

"In the world of science, nothing moves on guess work, only concrete proofs are accepted. The same is applicable here. Many specimens were collected by creating a hole in the Earth, and after their close study only we arrived at this conclusion."

"When so much is known, do you think there is scope for new findings?"

"See my dear, exploration, search for something new, all this forms part of human nature. It is in fact the key to progress. If man had not explored, he would have never known that there are rocks below the Earth which can be burnt."

"These rocks capable of producing fire must be made up of coal," Geetu guessed.

"Yes, it was coal that provided solution to so many difficulties."

"Industrial Revolution took place at that very time," Mother was not unaware of these things.

"Whenever these volcanoes erupt, many more facts emerge before us," Papa informed. "Long ago when a volcano erupted at Kimberley, many diamond studded pieces of rocks also came out with the *magma*."

"This happened many many years ago, but recently grains of gold were found in the volcanic release. The metal that lead us to the atomic era was also found from beneath the Earth."

"You seem to be referring to uranium perhaps! Atomic energy is after all the gift of uranium only," Mother added. Dr Mitra also nodded his head in agreement.

"Uncle, nothing of this sort was found here at this place?"

"No, not till now. Let us see, work is still going on."

"I think it is time for us to leave," Papa said.

"Where would we go now, Papa?"

"Now we will take a stroll on the sea beach," Geetu replied to Anshu's query.

"Sea is also spread out over a vast expanse. We get a lot of things from there too."

"Right. From an ordinary thing like salt to the priceless materials like gold, silver, copper, iron, petroleum, uranium all lie secure in the womb of the sea," Mother provided more information about the materials found inside the sea.

"Really! Then we shall certainly go to the sea beach."

"Yes, we will but first say thanks to Uncle. He has enlightened us about the Earth."

"Oh no, Mr Verma. In fact I invited you here because I appreciated the streak of inquisitiveness in your children. I must say, you have lovely kids."

"This streak is a gift from Dadaji. Replying to their questions is a matter of routine with him!"

"That's good. Okay then, bye...bye," Dr Mitra took leave after shaking hands with the children and headed for his camp.

V

Like the Earth, sea also attracted the attention of man. There is reference to the oceans in Indian mythology. The oceans cover almost 71 per cent of the Earth's surface. Everyone

has heard the story of the churning of the ocean! These ocean-churnings are taking place now also, but instead of nectar, venom or other jewels, we get minerals, chemicals and what not! As Anshu was sitting thinking about these things, he heard Papa's voice perhaps calling out to him.

"Are you people ready?"

"Papa, we have been ready for quite some time now," Anshu and Geetu replied together.

"Papa, where are we going today?"

"To the sea beach! Wow! Today, I will collect lots of sea shells and pearls," Anshu declared and glanced at his mother for approval. Mother burst into laughter at his facial expression but allowed him to collect shells and pearls.

Their taxi was moving quite fast. Tall, green trees along both sides of the road, and the scenic beauty kept everybody spellbound. This place was untouched by the pollution menace of Mumbai or Delhi. After a while, the sea was clearly visible at a distance.

"Oceans are the biggest reservoir of water on Earth, isn't it so Bhaiya? There is only water all around."

"Yes. There are many kinds of creatures in the sea—some small and some big."

"The first living creature was born in water only," Mother stated as the taxi came to a halt.

“You people wait here, I shall be back in two minutes,” instructed Papa while getting down from the taxi. He returned soon enough, but not alone. Somebody accompanied him. Papa introduced the man as Mr Malhotra who was to take them around the sea. Anshu and Geetu exchanged a strange look.



"What are you thinking? Don't you want to take a round of the sea? We shall travel by a new kind of boat."

"New kind of boat...?" Anshu's expression changed to awe.

"Yes, though it is shaped as an ordinary boat, its base is made of glass."

"This means that one can see through it in the water," Geetu expressed surprise.

"That is why it has been made of glass. See, be careful...you may come from this side. Yes...it is okay now," after making everybody sit comfortably, Mr Malhotra instructed the boatman to start.

Geetu looked at the base of the boat in amazement. Hundreds of creatures were blissfully floating in water. Geetu would clap in excitement every now and then or lift her feet out of fear that sea creatures might bite her.

"Aha! How colourful the fishes are..." Geetu exclaimed clapping delightfully, "But what is that net like thing there?"

"That is not a net stupid, but a plankton," Anshu informed Geetu and turning towards Papa said, "Nowadays even manure is made out of plankton, isn't it so?"

"Yes, we have to find alternatives to the things which are diminishing fast or are being consumed increasingly and are in short supply," Mother replied as Papa was busy talking to Mr Malhotra.

"Hey Papa look there..." Geetu pointed at a bulging enclosure, "What is that?"

"It appears that some boat has capsized after hitting a rock," Mr Malhotra stated.

"Rock? There are rocks in the sea too?"

"Of course! If the complete water of the sea is taken out, do you know what the base would look like?"

"There would be nothing except mud," Geetu frowned.

"No Geetu, the sea base is as uneven as our Earth—some high mountains here and some deep troughs there," Mother stated patting Geetu's nose.

"Some of the mountains here are even taller than Mount Everest," Papa said, "This may be due to shifting of the continents."

"Actually the uppermost layer of the Earth is not uniform everywhere. It is divided in many plates. These plates float over the *mantle*. The rumblings that take place in the *mantle* affect these plates also, causing them to move," Mr Malhotra paused and then continued, "Due to this movement, sometimes these plates get separated and sometimes they collide with each other. When two plates collide, they form a bulge on the surface of the Earth which gradually takes the shape of mountain ranges. But when the plates get smothered, they create troughs."

"This means that the old layer keeps giving way to a new one, isn't it Uncle?"

"Yes, that is why the volume of the Earth neither increases nor decreases."

"Papa I am feeling thirsty now."

"There is water everywhere, have a sip," Anshu jeered at her.

"No one can drink this water? It is full of salt. Absolutely useless."

"Geetu dear, this useless water only provides you salt, otherwise you would get food without salt," Mother highlighted the value of the salted water of the sea.

"Yes, I did not think about it. Besides salt, this water contains many other elements."

"Obviously, our dear Geetu cannot have this water, so we must return to the shore."

"Nowadays this water is also being treated to make it potable, isn't it Papa?" Anshu stated.

"You mean to say that I shall remain thirsty till then," Geetu exclaimed innocently in such a way that everybody burst into laughter.

Just then, their boat touched the shore and everybody stood up to get out.

"Papa, when we came to the shore, I saw some people collecting sand from the beach. See, many bulldozers are still doing the same thing."

"This sand contains many minerals which bear out many metals after they are cleaned," Mr Malhotra informed.

"But minerals are found inside the sea also!"

"Listen, it so happens that where you find shore today at some point of time there was sea water and vice versa," Papa claimed while stopping near a coconut vendor and ordering one for everybody.

Sipping at coconut water, Anshu remembered something and approached Mr Malhotra, "Uncle, nowadays I believe gas and petroleum are also being extracted from the sea."

"Yes, exactly."

"Where does the reservoir of gas and petroleum come from in the sea? Are they manufactured there," Geetu was always troubled by one or the other query.

"Yes they are manufactured there. The dead bodies of creatures get submerged under sand over millions of years and due to the bacteria and heat generated, they get transformed into oil and gas. The layers at the base also get transformed into rocks after becoming hard."

"But Papa, it is said that the reservoirs of many a mineral do not find an origin in the oceans, they are still lying beneath the rocks."

"Yes, there are many such reservoirs. Coal, iron, etc. are some of them. They are found deep inside."

"Extracting them must be a difficult job."

"If man idled around thinking that a job is impossible, how would he have progressed so far!" Mr Malhotra replied to Anshu and turning towards his father said, "Mr Verma, there is a big aquarium nearby. The sea has been depicted very well there—what and how are the things inside the sea, how are the minerals, etc. dug out and so on. All this has been demonstrated through models. I think you should take your kids to the aquarium. They will really enjoy it."

"Yes, Papa...please take us there."

"You can go there at this hour also. It is not very far," Mr Malhotra informed.

"Whatever the distance I will have to go. This naughty duo will not let me escape." Papa told Mr Malhotra before taking leave.

The aquarium was really a mini ocean. Anshu and Geetu stared at it unbelievably.

"Geetu, don't run here and there. Walk systematically from one corner to another.



Otherwise you will not understand anything," Papa instructed Geetu.

"But there are only colourful fishes here!"

"Have patience. You will find everything you crave to see," Papa said moving further.
"See this. An image of the base of the sea."

"But there are so many uneven hillocks!"

"In their midst are chimneys through which the stream of black water is flowing out," Anshu looked attentively.

"These hillocks are made up of copper, iron, zinc, etc. See it is written over there. And the water of the stream is also black because of these minerals."

"Oh, see Papa, so many potato shaped blocks are lying scattered here!"

"You fool, they are not potatoes but balls of minerals," Anshu's remark made Mother laugh.

"Anshu, come here. You wanted to know how they dig out minerals from such depths! See...it is shown here through this model."

"This seems simple," Anshu replied looking at it attentively.

"Yes, simple only to look at, but not when actually done."

"Of course, because it is quite difficult to say as to where the reservoirs of minerals lie," Mother expressed her agreement.

"There are ways to find but...okay, let's move on. See here... here another method is used."

"I feel that identifying reservoirs of minerals and their extraction from the sea is



comparatively easier than from the Earth."

"Yes, Bhaiya, I also feel so. No digging, nor any fixing of explosives in the rocks is required here."

"To work in the sea is also equally challenging! The strong waves from the sea, winds blowing with uninterrupted speed and the salty water, all this makes the job quite difficult. And one thing is much more difficult than this!"

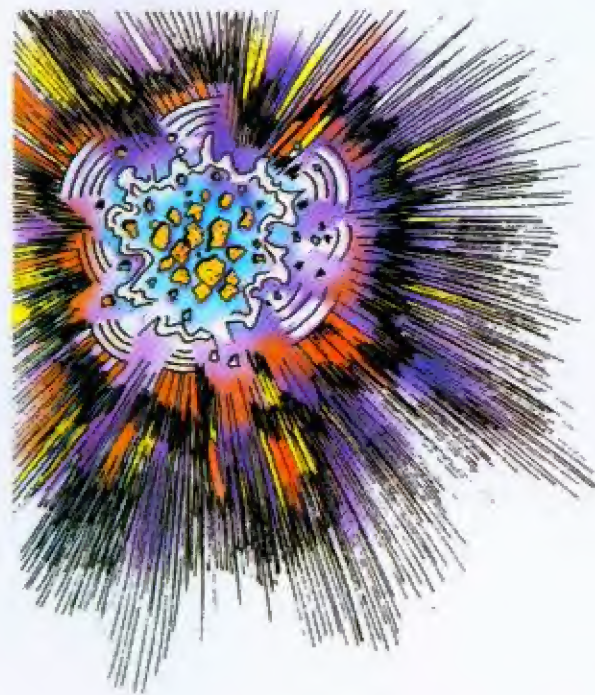
"What is that, Papa?"

"To move around in an aquarium on an empty stomach! What do you say, Geetu?"

"Oh yes, Papa, I am also feeling quite hungry."

"Then why delay? Let's hurry up."

All laughed together.





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